

Orange County Water District Celebrates New Local Water Supply

OWUE Water Recycling and Desalination Staff

On September 20, 2004, Orange County Water District and Orange County Sanitation District held the official groundbreaking ceremony for its new \$487 million Groundwater Replenishment (GWR) System water purification project. The ceremony was attended by Lester Snow, the Director of the California State Department of Water Resources, as well as 150 elected officials, community leaders and industry professionals.

During the ceremony, Mr. Snow stated, "The Department of Water Resources in an attempt to secure California's long-term water supply is attempting to promote an integrated regional water resource management strategy. We cannot pretend that the State of California can fix all the local water supply issues, but rather try to support activities such as this. As we go around the state to areas that have wastewater potential and groundwater potential, we point to this region and hope they will come to tour the project and understand what is being done here."



I pledge on behalf of the Schwarzenegger administration to continue supporting this activity. We have in the past found \$30 million worth of Proposition 13 grants that have supported this. We hope to continue some financial support and technical support, and be a part of this historic program here. We congratulate all of you for participating in it."

OCWD manages and protects the large groundwater basin underlying north and central Orange County. OCWD is a special district, separate from Orange County or any city government. It was created by the California Legislature in 1933 to oversee

Orange County's groundwater basin. The groundwater basin supplies more than half of the water needs for 2.3 million residents in the cities of Anaheim, Buena Park, Cypress, Costa Mesa, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Irvine, La Palma, Los Alamitos, Newport Beach, Orange, Placentia, Santa Ana, Seal Beach, Stanton, Tustin, Villa Park, Westminster and Yorba Linda.



The GWR System, a state-of-the-art water purification project, takes highly recycled water, formerly wastewater, that is currently released into the ocean and purifies it using the same technologies that purify baby food, fruit juices, medicines and bottled water. The GWR System will create a new supply of extremely high-quality water for use in an expanded seawater intrusion barrier and to augment groundwater supplies for north and central Orange County residents. When the project's Advanced Water Purification Facility is complete in 2007, it will produce 70 million gallons of purified water per day, enough water to provide for 144,000 families annually. To learn more about the project visit www.ocwd.com.

Congratulations to both OCWD and OCSD for their achievements on the GWR system project. It is worth mentioning that the GRS Project's communications team was awarded the top honor of 2004 Public Education "Program of the Year" from the WaterReuse Association for their work on the project announced in September at the WaterReuse Association's 2004 Annual Symposium held in Phoenix, Arizona.

Quality on Demand Recycled Water: A Brilliant Approach to Further Recycled Water Uses

Fawzi Karajeh

Recycled water, or the term "reclaimed water" now incorporated into California law, is defined in statutes as "water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur" (California Law, Government Code, Section 65040.12). Recycled water can be derived from a variety of wastewater sources such as municipal, industrial and agricultural. Water recycling can mean the treatment of wastewater to a quality that is usable or, more broadly, the activities of treatment, storage, distribution, and even the final application of recycled water.

The type of wastewater treatment and the degree to which it is treated to make recycled water suitable for use depends on the types of use, the potential exposure of humans to recycled water and the public health implications, and the water quality required beyond health considerations. The basic levels of treatment include primary, secondary, and tertiary. Not all wastewater receives all three levels of treatment. In California, secondary treatment is commonly the minimum level of treatment to meet legal requirements for discharge to surface waters and for many uses of recycled water. Tertiary treatment is sometimes required for discharge to surface waters to protect fisheries or protect some uses of the waters. Tertiary treatment is often required for recycled water where there is a high degree of human contact. Disinfection is usually required for either discharge or recycled water use to kill bacteria, parasites, and viruses that can cause illness.

The Department of Health Services specifies the levels of treatment for recycled water and publishes the standards in Title



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22 of the California Code of Regulations. Beyond the treatment required for health protection, certain uses have specific water quality needs. High sodium or boron in water can be harmful to crops. Water hardness can cause scaling in industrial boilers. Nitrogen and phosphorus can stimulate algal growth in ponds or cooling towers. Sometimes specialized forms of tertiary treatment are needed to remove specific chemicals that would make recycled water unusable. In recent years a more innovative approach is being practiced. Some customers with special quality needs may be served by their own delivery line from the water recycling facility. Recycled water producers under this approach design a separate additional treatment steps to provide two or more "Quality-On-Demand Recycled Waters." To add flexibility for customers at an acceptable additional cost, QOD recycled water can be produced per the users' specification through delivery agreement. This approach not only adds flexibility for customers needed water, but also helps to further the use of recycled water in California, in return, reduce the pressure on the limited conventional water sources in the State.



Reverse osmosis membrane modules (high-pressure pumps enable water passage through membranes)

In California, West Basin Municipal Water District has been the leader in producing QOD recycled waters or what they call it "Designer Water" to add flexibility for customers to meet their non-potable water demand through this reliable water supply source. WBMWD currently produces and sells approximately 43 million gallons of recycled water every day. WBMWD serves a population of about 850,000 people living in 17 cities located within the South Bay of Los Angeles County. The West Basin Water Recycling Plant in the City of El Segundo produces five different qualities of recycled water, all of which meet the

treatment and water quality requirements specified in the California Department of Health Services Water Recycling Criteria for the different recycled water applications. These 5 QOD recycled waters are:

Tertiary Water: Secondary treated wastewater that has been filtered and disinfected for a wide variety of industrial and irrigation uses.

Nitrified Water: Tertiary water that has been nitrified to remove ammonia for industrial cooling towers.

Softened Reverse Osmosis Water: Secondary treated wastewater pretreated by either lime clarification or microfiltration, followed by reverse osmosis and disinfection for groundwater recharge, which exceeds, most of the time, the state and federal drinking water standards.

Pure Reverse Osmosis Water: Secondary treated wastewater that has undergone microfiltration, Reverse Osmosis and disinfection for Chevron's low-pressure boiler feed water.

Ultra-Pure Reverse Osmosis Water: Secondary treated water that has undergone microfiltration, Reverse Osmosis, disinfection and second-pass reverse osmosis for high-pressure boiler feed water.

QOD recycled water could be expanded to include other uses such as computer chips industry, textile dying industry, power generation facilities, and nurseries.

It is true that there is most likely additional cost to produce QOD recycled water but for many communities, an investment to do that helps to solve other technical, economic, and environmental problems. This concept can be used to forestall a water shortage by conserving freshwater, provide a reliable local source of water, provide drought protection, improve the economic efficiency of investments, and improve community benefits by creating more jobs and human and environmental health protection. QOD recycled water approach is a brilliant idea and it may become a marketing strategy for many recycled water purveyor in many California communities and elsewhere. If the benefits supersede the cost, why not?